In the Specification:

The paragraph on page 2, spanning lines 5 through 14, has been amended as shown below:

The present application is related to the following co-pending applications which were filed on October 14, 1998 and which are incorporated herein in their entirety by reference: (i) Patent Application S/N 09/172,583, entitled "Robust Watermark Method and Apparatus for Digital Signals" by Earl Levine, now U.S. Patent No. 6,330,673; (ii) Patent Application S/N 09/172,936, entitled "Robust Watermark Method and Apparatus for Digital Signals" by Earl Levine and Jason S. Brownell, now U.S. Patent No. 6,209,094; (iii) Patent Application S/N 09/172,935, entitled "Robust Watermark Method and Apparatus for Digital Signals" by Earl Levine, now U.S. Patent No. 6,345,100; (iv) Patent Application S/N 09/172,937, entitled "Secure Watermark Method and Apparatus for Digital Signals" by Earl Levine, now U.S. Patent No. 6,320,965; and (v) Patent Application S/N 09/172,922, entitled "Efficient Watermark Method and Apparatus for Digital Signals" by Earl Levine, now U.S. Patent No. 6,219,634.

The paragraph on page 4, spanning lines 10 through 18, has been amended as shown below:

In accordance with the present invention, a basis signal which is used to watermark a digitized analog signal (the subject signal) is predetermined to enable embedding of transaction-specific watermark data ~~to be embedded~~ in the subject signal with minimal processing resources. Since the basis signal generally accounts for the majority of the processing resources required to watermark the subject signal, only a relatively small portion of the ~~requisite~~ available processing resources are used to embed transaction-specific watermark data into the subject signal. The transaction-specific watermark data is specific to the particular delivery of the digitized signal such that unauthorized copies can identify an authorized copy of the signal from which the unauthorized copies were made.

A2

The paragraph on page 6, spanning lines 10 through 14, has been amended as shown below:

In accordance with the present invention, a digitized signal is published with a blank watermark, i.e., a watermark which contains no specific watermark data, and a server computer system encodes specific watermark data into the watermark signal for each delivery of the digitized signal. Since a very small portion of server processing resources are required to produce a watermarked digitized signal, the watermarking workload of the server computer system is relatively light.

A3

The paragraph on page 7, spanning lines 16 through 24, has been amended as shown below:

A first embodiment of quick watermarker 144 (Figure 2) is shown as quick watermarker 144A (Figure 3). In this illustrative embodiment, quick watermarker 144A retrieves both the requested digital product, e.g., subject digital product signal 304 which is previously derived from subject digital product signal 302. Generation of a watermark basis signal from a digitized signal is described more completely in U.S. Patent No. 6,209,094 ~~Application S/N 09/172,936~~ entitled "Robust Watermark Method and Apparatus for Digital Signals" filed on October 14, 1998 by Earl Levine and Jason S. Brownell (hereinafter the "~~936 Application~~ '094 patent") and that description is incorporated herein by reference. In this embodiment, subject digital product signal 302 and basis signal 304 and uncompressed.

The paragraph spanning page 7, line 25, through page 8, line 10, has been amended as shown below:

Quick watermarker 144A also includes a bit stream generator 306 which derives from unique transaction data 308 a stream of bit stream segments 310. Bit stream segments 310 define the manner in which unique transaction data 308 are represented using basis signal 304. In this embodiment, each segment of bit stream segments 310 represents whether a corresponding portion of basis signal 304 is to be added to or subtracted from a corresponding portion of subject digital product signal 302. In addition, each segment of bit stream segments 310 specifies tapering of basis signal 304 at segment boundaries to avoid audible effects at segment boundaries in the resulting watermarked signal. Furthermore, bit stream generator 306 ~~pre-code,~~ pre-codes, convolutionally encodes, and cyclically scrambles unique transaction data 308 to reduce the likelihood that the resulting watermark can be detected, decoded, and/or removed without proper authorization. The segmenting, tapering of segment boundaries, pre-coding for inversion robustness, convolutional encoding and cyclical scrambling are all described more completely in the ~~'936 Application~~ '094 patent and that description is incorporated herein by reference.

The paragraph spanning page 8, line 24, through page 9, line 6, has been amended as shown below:

In a more complex and more efficient embodiment, publisher process 120 performs compression processing in addition to formation of a basis signal corresponding to the subject digital product signal. Referring to Figure 4, publisher process 120 includes a blank watermarker 406 which in turn includes a basis signal generator 408. Basis signal generator 408 receives a subject digital product signal 402 and produces therefrom a basis signal 404 in the manner described more completely in the ~~'936 Application~~ '094 patent and that description is incorporated herein by reference. Blank watermarker 406 also includes segment windowing logic 410 which divides basis signal 404 into logic segments and tapers basis signal 404 at segment boundaries to prevent audible effects at basis signal boundaries. Division into segments and tapering at segment boundaries are described more completely in the ~~'936 Application~~ '094 patent and that description is incorporated herein by reference.

The paragraph on page 10, spanning lines 4 through 6, has been amended as shown below:

Composite frame builder 506 ~~construct~~ constructs composite frames ~~516~~ 512 according to logic flow diagram 600 (Figure 6). Processing according to logic flow diagram 600 is further illustrated in Figure 7.

The paragraph on page 10, spanning lines 14 through 21, has been amended as shown below:

In step 604 (Figure 6), composite frame builder 506 (Figure 5) forms all permutations of the corresponding segments of the two streams. For example, composite frame builder 506 forms frame permutations 704 which include a separate frame permutation for each possible combination of watermark data that can be represented in segments 1A-C. For example, frame permutations 704 represent, from top to bottom, the following logical bit stream segments of watermark data: "111," "110,", "101,", "100," "011," "010," "001," and "000." All of frame permutations 704 are eventually represented in composite frame 710, which is included in composite frames ~~516~~ 512 (Figure 5).

The paragraph on page 12, spanning lines 1 through 14, has been amended as shown below:

In step 804 (Figure 8), composite frame packer 708 (Figure 7) determines the number of unique ones of compressed frames 706. Compressed frames 706 can include equivalent compressed from either (i) replication of frame permutations formed in the manner described above with respect to step 604 (Figure 6) or (ii) compression of portions of subject digital product signal 402 (Figure 4) with such low energy that any watermark signal is so slight as to be non-existent. Coding of a watermark signal in a portion of subject digital product signal 402 with low energy can introduce audible effects to subject digital product signal 402 . Mechanisms which enable a watermark signal to survive such low-energy portions are described in the ~~'936 Application~~ '094 patent and that description is incorporated herein by reference. Low energy portions of subject digital product signal 402 can result in suppression of a watermark signal to such a degree that two or more of compressed frames 706 representing different watermark data can be equivalent and indistinguishable. Composite frame packer 708 ~~recognized~~ recognizes equivalency of such compressed frames in addition to those which are equivalent through frame permutation repetition described above.

The paragraph spanning page 13, line 24, through page 14, line 7, has been amended as shown below:

Alignment of frame and segment boundaries results in an additional improvement. Compressed frames, such as frame 904A, end to have higher energy toward the center of the compressed frames. As described above and in the ~~'936 Application~~ '094 patent, segment windowing logic 410 (Figure 4) tapers basis signal 404 at segment boundaries to prevent audible effects at basis signal boundaries. IT should also be noted that, aside form the basis signal, the two alternative signals, namely the logical "0" stream and the logical "1" stream, are identical. Accordingly, at the boundary between segments 902A and 902B, the two alternative signals are nearly identical. Thus, the energy of frame 904A is highest at a point at which the alternative signals are most identical. As a result, the likelihood that alternate versions of frame 904A are equivalent is improved and the number of unique versions of frame 904A can be reduced, forming an even more compact representation.

The paragraph spanning page 14, line 25, through page 15, line 7, has been amended as shown below:

A watermark data bit stream generator 1010 of quick watermarker 144B generates a stream of watermark data bits from transaction identification data 1008 in the manner described above with respect to bit stream generator 306 (Figure 3) except that segments of a basis signal are unnecessary and tapering of the basis signal at boundaries is also unnecessary since both ~~segments~~ segmentation of the basis signal and segment boundary tapering ~~has~~ have been performed by segment windowing logic 410 (Figure 4) of publisher process 120 in the manner described above. Watermark data bit stream generator 1010 pre-codes, convolutionally encodes, and cyclically scrambles transaction identification data 1008 to reduce the likelihood that the resulting watermark can be detected, decoded, and/or removed without proper authorization. The pre-coding for inversion robustness, convolutional encoding, and cyclical scrambling are all described more completely in the ~~'936 Application~~ '094 patent and that description is incorporated herein by reference.